THE PLANT DISEASE REPORTER

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The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

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CROWN RUST OF OATS IN THE COASTAL BEND REGION OF TEXAS

George E. Altstatt

Numerous complaints have been received for the past month from growers of oats in the Coastal Bend area this season, stating that they were having trouble with rust in some of the resistant varieties, principally Rustler, grown in that area. Most complaints stated that plants showed severe reddening of the leaves, but that typical rust pustules were rather uncommon, and that although the leaves looked rusty, rust could not be rubbed off when the leaves were passed between the fingers.

During the week of April 9, a group made a trip through Fort Bend, Matagorda, Brazoria, Jackson, Victoria, Goliad, Bee, and Nueces counties to examine some of the affected fields. Included in the group were Dr. A. A. Dunlap, Chief of the Division of Plant Pathology, E. S. McFadden, Agronomist (USDA) of the Texas Agricultural Experiment Station, E. A. Miller, Extension Specialist in Agronomy, R. V. Miller, Chief of Field Seed Certification of the State Department of Agriculture, and the writer. The County Agricultural Agents joined the group in their respective counties.

Observations made indicated:

1. Crown rust of oats (Puccinia coronata) was present and doing considerable damage to susceptible varieties. In some cases, the only value to be obtained from the crop would be that from grazing, hay, or turning under for green manure.
2. The trouble in resistant varieties was partly in the nature of firing of the leaves, a typical reaction due to inoculum blown from close-by fields of infected susceptible varieties or from infected susceptibles growing in with the resistant variety. Mixtures of resistant and susceptibles varied from 10 to 50%. Even in those fields with mixtures as low as 10%, the resistant plants showed considerable firing.
3. None of the fields in which mixtures were involved, and which showed severe damage were directly traceable to certified rust-resistant seed stocks.
4. Clipping rust-resistant oats one or more times (for dehydration) resulted in lessening their resistance, and in the spread of crown rust.
5. Due to the great demand for oats at planting time, many of the lots offered as resistant varieties were either susceptibles, or mixtures. These were not certified lots.
6. Where pure stands of certified rust-resistant oats were grown, leaf (or crown) rust damage was negligible.
7. In some cases reddening of the leaves due to physiological causes had been erroneously attributed to rust. This reddening was probably due to lack of nitrogen and phosphorus, as other fields which had received these elements did not show the reddening of the leaves.

It was observed that stem rust of oats (P. graminis) was spreading rapidly in the coastal region, and that several fields nearing maturity had already suffered some damage.

EMERGENCY PLANT DISEASE PREVENTION PROJECT

OAT RUST IN WINTER GARDEN AREA OF TEXAS

R. D. Watson

In connection with work being done at the Texas Agricultural Experiment Substation No. 19, Winter Haven, on the forage value of oats in the Winter Garden Region, a survey was made during March of the oat rust problem, which is an important factor in the selection of a suitable variety for the section. The information from the substation plots was contributed by Mr. E. Mortensen, Superintendent. Survey was made with Jack L. Adams, County Agent, of Zavala County, and R. L. Guyler, Seedsman, who made it possible to identify the seed source and the variety of oats planted.

In this section oats are grown nearly exclusively as a winter crop for grazing. This season conditions have been favorable in general for the growth of grain and also favorable for the development of rust, which was epiphytotic resulting in a rather good test of varietal reaction to both stem rust (Puccinia graminis var. avenae) and crown rust (Puccinia coronata)

The survey was made to obtain information on rust resistance of the varieties under field conditions, and fields were visited in which the variety was known or could be determined. About 15 to 20% of the oat acreage in the county was visited. Data are summarized in Table 1.

Table 1. Prevalence of rusts on oat varieties in the Winter Garden region of Texas, March 1945

Variety	Total number fields and plots	Total acreage	Number of fields showing indicated amount of Crown rust					Stem rust				
			0	T	Mild	Moderate	Severe	Very severe	0	T	Mild	Moderate	Severe
De Soto	3	125		1	1				2	1			
Kanota	5	202	1				1	3	1				1
Ranger (test plot)							1					1	
Rustler	1	100		1					1				
Texas Red	17	3590	1		3	2	11		7	2	2	1	
Turf	2	50						2					
Victorgrain	8	247		1	1	4	1		2	2	1		2

The Turf oat is, by comparison with the other varieties, very susceptible to crown rust. Kanota and Turf are early and when rust is not a factor would be desirable for early grazing, but under conditions such as obtained this year crown rust caused considerable damage, and several fields were nearly a total loss. Texas Red is late in developing but a dependable forage producer from late February to April. It has been nearly immune from the stem rust strains present and is highly resistant to crown rust. This year, however, while nearly free from or only mildly affected by stem rust, in most locations it was heavily infected with crown rust. Some selections appeared to have more resistance than the common Texas Red.

Victorgrain, a semi-winter variety, earlier than Texas Red, was very highly resistant to crown rust but was severely infected with stem rust

late in the season. It is a good grazing variety, probably better than Texas Red.

De Soto possesses resistance to both stem and crown rust. It was the most resistant to both rusts of the varieties planted in the field, and was among the best in total forage production.

Rustler is comparable in resistance to both rusts to De Soto, but is not a very good forage producer in the winter, and is very late in coming into forage production, which distinctly limits its value.

Ranger in a test at Weslaco station was severely infected (March 20) with crown rust and moderately infected with stem rust.

Oats from the same seed source planted on the river silty clay loam soils were more heavily infected with rust than the same variety planted on sandy soils, apparently because of differences in moisture, humidity, and soil fertility and resultant growth.

Late-planted fields contained less rust than early-planted fields at the time of the survey but were probably more damaged by rust since infection took place at an earlier stage of development.

Grazing appears to spread spores and increase rust infections in the field.

EMERGENCY PLANT DISEASE PREVENTION PROJECT

DISEASES ON WHEAT AND RYE IN NORTHWESTERN OHIO

Alvin J. Braun

Wheat. A 3-day survey of winter wheat was made in Allen, Hancock, Hardin, and Wyandot Counties in Northwestern Ohio. As a result of the unseasonably warm weather persisting from early March to the present time, the wheat is about 3 weeks ahead of its normal development for this time of the year. In most fields it is already jointing. Close examination of the plants was made in 33 fields selected at random along the routes chosen.

The initial purpose of the survey was to determine the prevalence of a leaf spot (cause undetermined) which was called to the attention of the writer by Mr. C. R. Crum, County Agricultural Agent (Wyandot County) through Dr. C. C. Allison, Extension Plant Pathologist, Ohio State University. In the latter part of March, several farmers in Wyandot County reported excessive yellowing of the leaves associated with conspicuous brown spots. Two weeks ago the yellowing of the leaves in fields where the leaf spot was prevalent could be discerned at a considerable distance. At the time this survey was made, the new growth (relatively free from the leaf spotting) largely obscured the yellowing effect of the diseased leaves. From the evidence available it was concluded that the maximum development of the leaf spotting occurred during the latter part of March.

The leaf spots first appear as minute yellow specks. As these enlarge the centers become dark brown; later, a tan-colored area develops in the center of the dark brown tissue. When fully developed the brown spots are oval (1-1.5 mm x 2-3 mm) and are surrounded by a bright yellow halo. If the spots are very numerous, the distal portion of the blade soon becomes yellow and dies back from the tip. No exudate is present on the surface of the lesions, and the spots apparently do not develop from water-soaked areas. Microscopic examination of the lesions showed no fungus

or bacteria in the necrotic tissue.

This leaf spot was present in all of the 33 fields examined. In 5 of the fields the majority of the plants were moderately to severely affected (disregarding the condition of the new growth which was relatively free from lesions). Of the counties included in this survey this type of leaf spotting was more prevalent in Wyandot County. Unless the diseased condition reappears, little or no effect on the yield should result. Later in the season, further observations will be made in the more severely affected fields.

Speckled leaf blotch (Septoria tritici) was observed in more than 50% of the fields. Infection was limited to the basal leaf (expanded last year), although laboratory examination of the pycnidia showed that the spores were mature and being discharged. If conditions favorable for infection continue throughout the month considerable speckled leaf blotch may develop in those plantings where overwintered infections are numerous.

Powdery mildew (Erysiphe graminis var. tritici) was observed in 10 fields. In 8 of these fields infection was general, whereas in the remaining 2 fields only plants in dense clumps were affected.

Leaf rust (Puccinia rubigo-vera var. tritici) was found on a few basal leaves in 5 of the 33 fields. The mature uredia most likely developed from overwintered mycelium resulting from fall infections. Although present only as a trace it is significant to note that leaf rust of wheat is usually not detected in Ohio before the second week of May, according to records kept by Dr. W. G. Stover at Ohio State University.

Freezing temperatures on April 6 and 7 killed the leaf tips in many of the fields. No serious frost damage was noted.

Rye. A 10 acre planting of rye 4 miles east of Lima, Ohio (Allen County) was observed in which leaf rust (Puccinia rubigo-vera var. secalis) was estimated at 90% prevalence and 15% severity. Plants were in the jointing stage. The rust was prevalent on the new growth indicating extensive spread during the past few weeks. In this field the rust had reached the telial stage. Leaf rust of rye, according to Dr. Stover's records is usually not detected before the second week of May. A trace of leaf rust and powdery mildew (Erysiphe graminis var. secalis) was found in a large field of rye in Hardin County.

EMERGENCY PLANT DISEASE PREVENTION PROJECT

WHEAT AND BARLEY DISEASES IN SOUTHERN ILLINOIS

J. S. Tidd

From April 9 to 13, Dr. Benjamin Koehler of the University of Illinois and the writer surveyed approximately 80 fields of winter wheat and 15 of winter barley for disease in Southern Illinois. Stops of 5 minutes or longer were made at each field. While en route a much larger number of other wheat plantings were observed but time did not permit the making of stops for examination. The survey was principally devoted to counties in the Southeastern and Southwestern parts of the State. Wheat varied in height in the different fields, averaging from 4 to 6 inches in some, and up to a foot in height in others. The same was true of barley.

Wheat. In Edgar, Lawrence, Wabash, Edwards, and White Counties in the Southeast, no mosaic (virus) was observed although it had been reported in 3 of these counties in previous years. It was, however, present in experimental plots in Clark County. Apparently this disease is not widespread in this part of Illinois or else varieties resistant to it are grown. These counties are across the Wabash River from areas in Southwestern Indiana surveyed by the writer in the latter part of March 1945 and where no mosaic was found. Septoria tritici occurred on the lower leaves of many plants in most of the fields but was not present on the new growth. Powdery mildew (Erysiphe graminis var. tritici) was widespread in one field in Edgar County giving a type 3 reaction on all the lower leaves. Elsewhere in the Southeast area it occurred as a trace. An occasional pustule of leaf rust (Puccinia rubigo-vera var. tritici) was observed on the lower, older leaves of about 10% of the plants in one field in Wabash County. At other points in the Southeastern Counties leaf rust could be found only by diligent searching, occurring in trace amounts. None was observed in the nearby Southwestern Indiana wheat areas 3 weeks earlier when surveyed by the writer.

In Jackson, Randolph, and Madison Counties, wheat growing in the bottomlands along the Mississippi River and the so-called "second bottoms" was, in general, several weeks further advanced than is usual for this time of the year, already jointing in many of the fields. Mosaic (virus) plants were found in 11 of the 22 fields examined in Madison County and in no fields in Randolph or Jackson Counties. Prevalence of highly susceptible plants varied from 0.5 to 1%. Some resistant varieties are planted in this section and very likely the plants with striking mosaic symptoms were from seed of susceptible varieties that were mixed with the resistant. In several fields, however, the "resistant" plants showed slight mosaic symptoms. But one field was observed in Macoupin County with mosaic plants, prevalence amounting to 1%. In Christian and Macon Counties toward the central part of Illinois no mosaic was observed.

As in the Southeastern section, speckled leaf blotch (Septoria tritici) was moderately prevalent on the older, lower leaves in many of the fields. Powdery mildew occurred in trace amounts in several fields and was moderately prevalent in 2 of the 58 fields examined in the Southwestern Counties.

Leaf rust was more in evidence than in Southeastern Illinois. In Jackson, Randolph, and Madison Counties it occurred as a trace in many of the fields. Moving northward into upland areas in Macoupin, Montgomery, and Christian Counties, leaf rust prevalence and severity increased. In 7 of 15 fields inspected in these counties, prevalence was estimated at a trace. Prevalence was higher and varied in the other 8 fields in the 3 last-mentioned counties. In 2 of the 8 fields, lower leaves of all plants were uniformly infected with rust, 10 or more pustules being present on each leaf. In the other 6 fields, pustules occurred on lower leaves of 5 to 50% of the plants but intensity was lighter. Given the proper environmental conditions in the next few weeks, it would appear that with the inoculum now present in some fields, leaf rust might increase to such an extent that considerable damage would result on susceptible varieties of winter wheat in Southwestern Illinois.

Barley. Of the 15 winter barley fields surveyed, leaf rust (Puccinia anomala) and powdery mildew (Erysiphe graminis var. hordei) were found in only 1, that on bottomland in Jackson County. The lower leaves of all plants in this 5-acre field were uniformly infected, nearly 50% of the

surface being covered with rust and mildew.

In Edwards County, 2 fields were observed with plants yellowed, stunted and dying from an unknown cause. Both fields were gently sloping with scattered lower areas. In addition to occurring in such low spots, chlorotic stunted plants were also found in other portions of the 2 fields. From 10 to 20% of the acreage was thus affected. Possibly the cause may be physiological or even a virus may be involved. Affected plants are now in the process of being studied. In Madison County, 5 fields were also seen with plants presenting the same symptoms.

EMERGENCY PLANT DISEASE PREVENTION PROJECT

DISEASES OF WHEAT AND OTHER SMALL GRAINS IN SOUTHWESTERN IOWA

Edgar F. Vestal

In the Plant Disease Reporter Supplement No. 156, April 7, 1945, Chester and Larsh forecast the most serious wheat leaf rust epiphytotic in several seasons if conditions remained favorable for the pathogen. They based their report on the findings in the wheat regions of Texas, Oklahoma, Kansas, Arkansas, and other sections of the Southern Plains Area. Reports issued by the United States Department of Commerce Weather Bureau in the various States growing winter wheat, as well as the Weekly Corn and Wheat Bulletin and other similar publications, all agree that the 1945 season is well advanced, in some sections as much as 2 weeks over the normal season. This would mean abundant early leaf growth and that one might expect to find leaf rust in the Iowa fields, especially in view of the fact that for some of the time in March the wind blew from the southwest with sufficient force to carry spores for a considerable distance.

A survey of the wheat fields in the southwestern section of Iowa during the period of April 18 to 21 disclosed leaf rust (Puccinia triticina) [P. rubigo-vera var. tritici] infections in all but one of the fields. Most of the wheat was from 3 to 4 inches tall and had not really started to grow after the long cool winter. Infections in most of the fields varied from a trace to as much as 6 to 10 sori on the older leaves. In some cases the sori were dark, indicating that they had been on the leaves for some time, possibly all winter.

The most severe leaf rust infections were found on the wheat growing on the uplands. There was much less on the Missouri River Valley bottom lands. Few of the farmers knew the variety of wheat being grown on their farms but characters of the wheat with the lowest infection were very similar to those of Iowin. The heavily infected wheat was evidently a susceptible variety.

In company with Dr. H. C. Murphy, the Iowa Agricultural Experiment Station wheat section was examined for leaf rust. Rust was found on all varieties but only in a very light form. At the same time leaf rust was found on barley and rye. On barley Puccinia anomala was generally present but not doing any damage. On rye, Puccinia dispersa [P. rubigo-vera var. secalis] was general on the lower leaves and even on the old dead leaves, indicating that it might have overwintered on the plants.

Barley, rye, and wheat were all 3 found to be heavily infected with powdery mildew. In the test row barley plots of barley, Erysiphe graminis var. hordei was doing some damage, as stems and leaf bases were often

infected. The same was true of E. graminis var. tritici on wheat. A field of Iowin near the test plots was also found infected and most of the basal leaves were yellow and dying. On a field of rye on the Iowa State College farm E. graminis var. secalis was also doing some damage where the plants were somewhat over a foot in height.

In addition to the powdery mildew and leaf rust, rye was also infected with a bacterial disease which at this time has not been positively identified. Many of the spots were like those produced by Xanthomonas translucens f. sp. cerealis, but the presence of other characters left identification in doubt.

If weather conditions remain favorable for powdery mildew, serious losses may result in local areas.

In the Southwestern part of the State little powdery mildew was found on wheat, but speckled leaf blotch (Septoria tritici) was very common and was doing some damage to the young plants. It was more common on the lower land of the Missouri River Valley bottom than the upland wheat.

EMERGENCY PLANT DISEASE PREVENTION PROJECT

DISEASES ON WINTER GRAINS IN MISSOURI

T. W. Bretz

From April 1 to 14, surveys were made for the incidence of disease on winter grains in several Central Missouri counties and along a route extending from Central Missouri eastward to the Mississippi River, then south as far as Scott County. Dr. Paul R. Miller accompanied the writer for one day of the survey in Central Missouri.

Wheat. In Central Missouri wheat ranged from the rosette to joint stage of development. In the Eastern and Southeastern counties, most fields were in the joint stage. Leaf rust (Puccinia triticina) [P. rubigo-vera var. tritici] was found in every field examined. In Central Missouri prevalence ranged from a trace to 100%. The infections were, in general, limited to the lowermost leaves, although in a few fields in the joint stage of development, pustules were found well up on the younger foliage. The intensity of infection did not exceed 5%, according to the modified Cobb scale (USDA scale). However, it is believed that if weather conditions favorable for the continued development of leaf rust prevail, a serious and damaging epiphytotic of this disease is likely to develop in Central and Southwestern Missouri. (No surveys have yet been made in the Northwestern, North-central and Northeastern areas.)

Contrasted with the threatening leaf rust situation in Central and Southwestern sections wheat fields in the East-central and Southeastern counties, in general, show very little infection. Although leaf rust pustules were found in all fields examined, with few exceptions the infection was very light and scattered. The wheat in these sections is well advanced into the joint stage and growing rapidly, and it is thought that the chances are good that it may escape serious damage from leaf rust infection.

No stem rust infection has been observed to date.

Powdery mildew (Erysiphe graminis) infection was found in a number of fields, particularly in low-lying situations and where the suscept growth

was unusually lush. Particularly heavy and damaging powdery mildew infection was found in several river-bottom fields in eastern Saline County. In these fields from 50 to 75% of the foliage showed incipient to well established infections, with profuse sporulation on the older lesions on the lowermost leaves. Powdery mildew infection in other fields was light and scattered and generally confined to the leaves nearest the ground.

Speckled leaf blotch (Septoria tritici) infection was observed in the majority of fields. Its prevalence ranged from light, scattered infection to moderately heavy, vigorous infection on 100% of the stand. Some damage will likely result in the more severely infected stands.

Mosaic (virus) infection was found to be generally distributed through the river-bottom area in St. Charles County. This disease was also found in several fields in northern St. Louis County and in a river-bottom area southeast of St. Marys in Perry County. All infections appeared to be of a mild form and were doing no apparent damage. A few fields in southeastern Missouri were found in which light anthracnose (Colletotrichum graminicolum) infection was generally prevalent on the foliage.

Barley and rye. Limited observations were made on a few stands of winter barley and rye in Southeastern Missouri. These crops were in the boot to heading stage of development. On barley, light powdery mildew (Erysiphe graminis) infection was generally distributed throughout the stands and brown spot (physiogenic) was general in a number of fields, but light in intensity. Neither disease appeared to be very damaging. On rye, light, scattered leaf rust infection (Puccinia dispersa) [P. rubigo-vera var. secalis] was observed and in one field, moderately heavy Septoria leaf blotch (Septoria sp.) infection was observed.

EMERGENCY PLANT DISEASE PREVENTION PROJECT

LEAF RUST AND OTHER DISEASES ON WHEAT IN NEBRASKA

C. M. Slagg

Seventy-eight fields in 28 Eastern, Central and Southwestern counties have been examined during the two weeks prior to April 14. In Southeastern Nebraska, leaf rust (Puccinia rubigo-vera var. tritici) is plentiful to abundant, with secondary infections apparent even on the upper leaves of early fields. In Northeastern counties, both leaf rust and growth of wheat are less advanced, but plenty of rust is present to furnish inoculum for later infections. In Western and Southwestern areas, drier weather has held back both the growth of wheat and the secondary leaf rust lesions, but new pustules were found in every field examined. It is apparent that leaf rust lived over winter in all parts of Nebraska, and may be capable of causing large losses if favorable environmental conditions occur.

In November, 1944, 4 very badly rusted fields were selected and spring examinations made to determine if the heavy fall infection affected the winter hardiness of the plants, and to see if these heavily infected fields showed leaf rust earlier in the spring. The fields selected were located in Gage, Lancaster, Dodge, and Redwillow Counties.

The mild winter vitiated winter hardiness observations. Leaf rust ob-

servations were not in line with what might be expected. Examinations in late March and early April disclosed less rust in these fields that had suffered heavy rust and partial defoliation in the autumn, than in neighboring fields that showed less rust earlier. The results observed were uniform in all fields selected for observation. In every case more dead leaves were present at the bases of the stools, and the plants were somewhat slower to start growth in the spring, than in neighboring fields with lighter autumn infection. Why there should be less rust in the spring in these heavily fall-infected fields is not clear, but every field selected for observation showed a similar picture.

Speckled leaf blotch (Septoria tritici) was found in all areas, being especially abundant in Southeastern Nebraska. Secondary infections were found on many upper leaves in this district. Under drier conditions in Western wheat fields, infection was largely confined to the lower leaves.

Helminthosporium (H. sativum and H. tritici-vulgaris) spots were sparingly present in nearly every wheat field examined. In many Central and Western fields, leaf spotting of an undetermined type was present which may be bacterial. Specimens have been sent to Washington and to Stillwater for diagnosis, and Hurley Fellows at Manhattan is also making isolations.

Powdery mildew (Erysiphe graminis var. tritici) was found in 14 fields, but was most abundant in Southeastern Nebraska.

EMERGENCY PLANT DISEASE PREVENTION PROJECT

DISEASES OF SMALL GRAINS IN CENTRAL TEXAS

George E. Altstatt

During the week of April 2, a trip was made through the small grain area of Central Texas. The points traversed included Waco, Eastland, Baird, Brady, Fredericksburg, New Braunfels, and Austin.

Rusts:

Oats. Crown rust (Puccinia coronata) was observed in all fields of oats, varying from trace to mild infection, with the exception of a few fields in the vicinity of Austin, where severe damage occurred. In most of the fields, occasional volunteer or very susceptible plants were encountered, which were heavily infected.

Stem rust (P. graminis) was seen only in the vicinity of Temple, where one field of maturing oats was lodging due to the severe stem rust infection.

Wheat. Leaf rust (P. triticina) [P. rubigo-vera var. tritici] was present in all areas visited. It was generally mild, with the exception of one field near Baird, which had rather heavy infection.

No stem rust was observed on wheat at this time.

Rye. Leaf rust of rye (P. rubigo-vera var. secalis) was present in fields at Temple and Gorman. Infection was mild.

Barley. Leaf rust (P. anomala) was present in all fields of barley. Infection was mild in all areas.

Wild Flax. Linum lewisii in the vicinity of Baird showed general rust infection (Melampsora lini).

Other Diseases:

Traces of loose smut of oats (Ustilago avenae) and covered smut of barley (U. hordei) were observed in fields near Clifton. In general, fields which were in head were entirely free of smut.

Traces of Helminthosporium avenae were seen in nearly every field of oats.

Septoria leaf spot of wheat was present in trace amounts in the Bosque River area (Clifton).

A trace of bacterial stripe of oats (Pseudomonas striafaciens) was observed in fields near Specgleville.

On barley leaf stripe (Helminthosporium gramineum) and leaf spot-blotch (H. sativum) were general, the former more common this season than last.

In the Bosque River area (near Clifton) powdery mildew had done considerable damage to barley, particularly in fields which had poor drainage. Slight powdery mildew damage was observed on barley in most areas, but generally increased where fields were low or poorly drained.

EMERGENCY PLANT DISEASE PREVENTION PROJECT

SHORTER NOTES ON DISEASES OF CEREAL CROPS AND GRASSES

Except where noted, reports are of Emergency Plant Disease Prevention Project surveys.

EARLY APPEARANCE OF WHEAT LEAF RUST IN NEW YORK: Dr. L. J. Tyler reports the presence of a trace of leaf rust (Puccinia rubigo-vera var. tritici), on winter wheat in the Cornell University plots at Ithaca, April 12. This extremely early appearance of leaf rust was undoubtedly favored by the constant heavy protective snow coverage from the last of November until the last of February, followed almost immediately by unseasonably warm weather that has progressed spring work a month ahead of schedule. If spring weather should continue to be favorable for leaf rust development it is quite possible that a heavy epidemic of leaf rust may develop.

Dr. Tyler also mentioned the presence of a heavy infection of powdery mildew (Erysiphe graminis var. tritici). -- Robert C. Cassell.

CEREAL DISEASES IN VARIETAL TEST PLOTS IN WEST VIRGINIA: During this period April 2 to 14 disease notes were taken at varietal test plots at Kearneysville, Wardensville, Morgantown, and Reedsville through the courtesy of Dr. G. G. Pohlman, head of the Agronomy Department at West Virginia University. Notes were also taken in the USDA barley winter hardiness nursery at Kearneysville.

On wheat powdery mildew (Erysiphe graminis) was the most prevalent disease in all tests. It was most severe at Reedsville and Wardensville. The Agronomy Department had no varietal test at Kearneysville, and no diseases of more than trace prevalence were seen in the test plots at Morgantown. Leaf rust was found at Wardensville and Reedsville and in the rust nursery at Kearneysville. An unidentified leaf spot, probably the same as that observed at Staunton, Virginia, occurred in trace to moderate severity at Kearneysville, and trace prevalence at Wardensville. Low temperatures at Reedsville had damaged the leaves of two wheat varieties,

Indiana 3217-29 and Indiana 3280-10.

The leaves of all barley varieties in the plots at Reedsville, were damaged by low temperature, and the tender shoots of the Wong variety were killed. A leaf spot, probably spot blotch (Helminthosporium sativum), was severe on almost all varieties. Powdery mildew was most severe at Wardensville and Kearneysville and less severe at Morgantown and Reedsville. Leaf rust (Puccinia anomola) was seen only at Kearneysville both in the varietal test and in the winter hardiness nursery.

The only disease observed in small tests of winter oat varieties was leaf spot caused by Helminthosporium avenae.

Rye leaf rust (Puccinia dispersa) [P. rubigo-vera var. tritici] was approaching epiphytotic proportions in fields near Kearneysville. --R. E. Atkinson.

DISEASES ON BARLEY AND OATS IN WESTERN OREGON: In Washington, Linn, Lane Counties (March 9-16) the prevailing complex of soil fertility and cool wet weather has caused much chlorosis in barley and leaf-reddening in oats. Although this loss of functional leaf area admittedly has some deleterious effect, the question arises whether the cost of correction by drianage and fertilizers would be justified in the ultimate crop. Evidence of root rot was found but it was not apparent as a primary factor at this time.

Several specimens were submitted to Dr. Roderick Sprague for critical examination. He reports the following organisms obtained by isolation from the specimens:

Rhizoctonia solani, from oats and barley
Trichoderma konigii, parasitic on R. solani
Fusarium oxysporum, from oats
Pythium ultimum, from oats
Pythium debaryanum, from oats
Pythinum aristosporum (P. graminicolum) from oats
Botryotrichum piluliferum, saprophyte, from barley

Barley plants showed root necrosis suggestive of Pythium but plants did not reach Dr. Sprague in satisfactory condition for critical study.

The distribution of eye spot (Rhizoctonia solani) in a rolling field of barley in Lane County was of interest. In such a field, the distribution and severity of the disease followed respective contours. The disease was more prevalent and severe in the higher parts of the field where erosion and grading had removed the more fertile surface soil.

Scald (Rhynchosporium secalis) was prevalent in variable amounts. The most severe cases were noted in the lower areas. --Lytton W. Boyle.

SUPPLEMENTARY REPORT ON MOLDING OF STORED CORN IN NEBRASKA: Autumn surveys in 87 fields in 27 eastern Nebraska counties showed an average loss of 6.5% from field ear rots before harvest. During March 7-14, 136 lots of corn in permanent and temporary storage in 6 eastern Nebraska counties were probed and tested for moisture content. Mold counts were made on 73 lots of corn in 3 counties in various storage situations. The results of this spring survey have been reported earlier, showing an average loss of 9.49% from molds in the cribs examined. Much of the field ear rot, as pointed out earlier (PDR, Apr. 1, p.285), did not get into the

cribs, as many of the worst ears were discarded at harvest time. On the basis of counts made, not earlier reported, it is estimated that about 6.0% additional mold loss occurred in corn in storage after harvest in the cribs examined. If these estimates are correct, and they are believed to be conservative, the corn growers of Nebraska have suffered an additional loss of $18,000,000 through crib mold.--C. M. Slagg

PHLEUM PRATENSE L., A NEW NATURAL HOST FOR UROCYSTIS AGROPYRI: During the fall of 1944, the authors collected numerous diseases of forage crops in some of the New England States (Cassell, R. C., and K. W. Kreitlow. Diseases of forage crops in Northern New England. PDR 28: 1184-1188. 1944). Near Brandon, Vermont, a large field of timothy and alfalfa was inspected and a considerable number of the timothy plants were observed to be smutted. One area, in particular, was estimated to contain 50% diseased plants. At the time it was thought that the smut was Ustilago striaeformis (West.) Niessl, the common stripe smut of timothy, but later when examined under a microscope the attacking fungus was identifed as a species of Urocystis, similar in general characteristics to U. agropyri (Preuss) Schroet. This seems to be the first time that any species of Urocystis has been reported on Phleum pratense[1]. Specimens of the disease have been deposited in the Mycological Collections of the U. S. Bureau of Plant Industry, Soils, and Agricultural Engineering.--K. W. Kreitlow, U. S. Regional Pasture Research Laboratory, State College, Pennsylvania, and Robert C. Cassell, Emergency Plant Disease Prevention Project.

DISEASES REPORTED ON LEGUMINOUS FORAGE AND COVER CROPS

Unless otherwise noted, reports are by members of the Emergency Plant Disease Prevention Project.

ALFALFA DISEASES IN NEBRASKA: Bacterial wilt (Corynebacterium insidiosum) was common in all old stands. Some of the most badly affected fields were in irrigated areas.

Downy mildew (Peronospora trifoliorum) was present in all first year stands. Losses were hard to estimate, but were not more than 5% in the worst fields seen. Sporulation was abundant only in the southern and southeastern counties.

One field was seen on fertile soil in the Elkhorn Valley, in which a part of the field showed poor growth and yellowing. This condition ceased at a distinct line in the middle of the field, indicating a different cropping history for this part of the field. It was tentatively diagnosed as sulfur deficiency.--C. M. Slagg, Mar.-Apr.

FROST INJURY TO ALFALFA AND CLOVER IN OHIO: Clover and alfalfa fields in Allen, Hancock, Hardin, Logan, Union, and Wyandot Counties were moderately damaged by the freezing temperatures of April 6 and 7. In many fields most of the current season's growth (6 to 10 inches) was killed. In others only the tips were affected. No killing of plants by the freeze was observed.--Alvin J. Braun

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[1] [NOTE: In the Mycological Collections of the Division of Mycology and Disease Survey there is a specimen, collected in Missouri in 1917 by Charles Drechsler, of a smut on timothy tentatively identified as Urocystis agropyri.]

was observed.--Alvin J. Braun

LEAF SPOTS ON CRIMSON CLOVER IN MISSISSIPPI AND LOUISIANA: Polythrincium trifolii and Cercospora zebrina were found to be generally distributed on lower leaves throughout Marion County in southern Mississippi. One field of crimson clover, of about 10 acres, was seen near Lockport in La Fourche Parish in southern Louisiana. The lower leaves were heavily spotted by C. zebrina.--Douglas C. Bain, Mar. 19-Apr. 5.

A FURTHER REPORT ON LUPINE DISEASES IN ALABAMA AND GEORGIA: In a previous report (PDR 29 (8): 211) the writer suggested that when infections by root and foot rot organisms occur in the early seedling stage, the damage resulting is severe and most plants die. Infection after the plant has become well-established causes less damage, and many of the diseased plants recover. A limited survey was made in the Dothan section of Georgia and Alabama, in fields where a full crop of seed had been set, to learn something of the extent of damage caused to the mature plants by foot rots.

In all fields examined a considerable number of dead or severely damaged mature plants were found. The symptoms exhibited by many of the dead or damaged plants were typically those of foot rot. This suggests that, while diseased plants showed definite signs of recovery earlier in the season, some of them die after setting only a partial fruit crop. Sclerotium rolfsii was found to be much more active than earlier and was causing considerable damage in some fields.

A stem blight that the writer had not encountered before was found to occur extensively in a field 2 miles south of Headland, Alabama. The organism associated with the blight was identified by Dr. Lindsay S. Olive as Diplodia theobromae (Pat.) Nowell. Infection apparently initiated near the soil line and progressed up the stem. In many cases the entire stem was involved. The organism was fruiting freely on the lower part of the stems.

Since Diplodia spp. are considered to be weak parasites, it is possible that the occurrence here may be secondary. Inoculation studies will be necessary to determine the true pathogenicity of this species on lupines.

Botrytis stem blight was found to be causing severe damage to mature plants in fields in Baldwin County, Alabama. The plants attacked were of the same size as nearby healthy plants. As far as could be determined, the plants had not been injured by cold.--G. M. Stone

DISEASES REPORTED ON FIELD PEAS: Creole and Austrian winter pea plants sent in to the writer from the nursery of the Soil Conservation Service at Minden, LOUISIANA, were heavily infected with Ascochyta (? A. pinodella). Mr. George T. Ratliffe, nursery manager, wrote as follows, "Two plantings of Louisiana Creole peas . . . have been almost killed out. Plantings of Papago peas (seed from Arizona) . . . are about 50 and 30%, respectively, killed out at this time. The rate of progress of the disease in 2 similar plantings of Austrian winter peas (seed from Oregon) is about the same as in the Papago peas. It is believed that all of the plantings will have been killed, regardless of the variety, within the next 10 days or 2 weeks."--Douglas C. Bain, Mar. 19-Apr. 5.

Field peas in Washington County, OREGON (March 29), have been severely injured by stem lesions (cause not fully determined). This was readily

evident in all fields visited from Jackson Flats to Bethany. In many cases the peas were so severely stunted that they were not easily seen in the cereal crop with which they were planted. The crop will be cut from 60 to 70%.--Lytton W. Boyle

BACTERIAL BLIGHT ON PURPLE VETCH IN CALIFORNIA: Bacterial blight (Phytomonas [Pseudomonas] pisi) was observed for the first time by P. A. Ark to be common in Contra Costa and Stanislaus Counties. The disease was first described from specimens from Sonoma County. A survey at the end of March indicated moderate injury to cover crops, but the disease was of little importance because the plantings were being disced under at the time the disease became serious. Moderate to severe losses were occurring in fields to be used for seed (about 75 of the 400 acres of the seed fields were examined). The grower agreed to treat the seed in order to prevent seed transmission if adequate recommendations for treatment could be made. --P. A. Ark, University of California at Berkeley, and Henry Schneider, Emergency Plant Disease Prevention Project.

DISEASES OBSERVED ON VETCH IN WESTERN OREGON: Stem rot (cause not identified) was prevalent in Washington County (March 15). It was very patchy in distribution, both between fields and within individual fields.

Downy mildew [Peronospora viciae] was prevalent in the area north of Hillsboro (March 30). On the whole it had not caused great damage, but it presents a potential hazard if subsequent conditions favor its further development.--Lytton W. Boyle

FUNGI ISOLATED FROM PEANUTS COLLECTED IN SOUTH CAROLINA IN 1944

Alton E. Prince[1]

Peanut collections were made in 10 counties, including Aiken, Bamberg, Barnwell, Darlington, Dillon, Florence, Hampton, Laurens, Orangeburg, and Pickens. Varieties represented are mostly Virginia Bunch and Spanish Bunch, but through the cooperation of Dr. C. J. Nusbaum, Pathologist at the Edisto Experiment Station, Blackville, and Dr. C. H. Rogers, Pathologist of the Coker's Pedigreed Seed Co. at Hartsville, additional varieties from their variety tests were used, including African, Spanish, Improved Spanish, Tennessee Red, Tennessee White, and Valencia.

With one exception, all of my collections were made from the stacks in fields. One collection was made from a warehouse at Aiken. In all cases the peanuts were dry and in the shells at the time cultures were made. All peanuts used from which results are recorded here were surface-sterilized in either mercuric chloride 1:1000, or BK solution with about 6% available chlorine, before being placed on 2% water agar for incubation. Isolations were made from the incubated peanuts, and the isolates retransferred until pure cultures were obtained.

Pure cultures of the fungi, obtained in this way, were sent to Dr. Lindsay S. Olive at Beltsville, Maryland, for determination except when an isolate could be positively identified by the writer.

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[1]The writer is indebted to Dr. C. H. Arndt for assistance in some of the culture work.

A total of 222 peanut seeds were plated from 45 collections. Usually 5 peanuts with a portion of the shells were plated from each collection. Fungi were obtained from 145 of these seeds. Isolations were made from the shells to determine the correlation between fungi in the shells and in the seeds. The same organisms were found in both.

Those fungi isolated from 5 or more peanuts are listed in the table below, with the frequency of occurrence in the seeds.

Fungi Isolated from Peanuts Collected in South Carolina in 1944

Fungus	Number of times isolated from seeds
Alternaria spp.	10
Diplodia natalensis	5
Fusarium oxysporum	8
Fusarium reticulatum	6
Fusarium spp.*	46
Penicillium spp.	5
Sclerotium bataticola	8
Sclerotium rolfsii	6
Trichoderma viride	9
Sterile fungi	10
	111

*Determined as to genus only

Other fungi, isolated from less than 5 seeds, are as follows: Curvularia inaequalis, Fusariella sp., Fusarium sp. (discolor group), F. chlamydosporum, F. lateritium, F. lateritium var. uncinatum, F. moniliforme, F. solani f. eumartii, Gliocladium catenulatum, Mucor sp., Rhizoctonia solani, Rhizopus artocarpi, R. nigricans, Rhizopus sp., and Sclerochaeta sp. Bacteria were isolated from 5 peanuts.

Little is known concerning the pathogenicity of these fungi or their relative importance in seed peanuts, but it is believed that the above list is a fair representation of peanut seed-borne fungi in South Carolina.

It is of interest to note that nematodes were frequently present when non-surface sterilized peanut seeds were plated.

There is at least one significant fact to be obtained from this work, and that is that these fungi are frequently correlated with internal decay that may well be similar to the "concealed damage" reported by Coyt Wilson and J.P. Wilson (PDR 29: 61-63. 1945).

EMERGENCY PLANT DISEASE PREVENTION PROJECT

REPORTS ON DISEASES OF FRUIT CROPS

Except where noted, reports are of Emergency Plant Disease Prevention Project surveys.

SCAB AND BLACK ROT LEAF SPOT ON APPLE IN PENNSYLVANIA: Scab (Venturia inaequalis) started to show on apple leaves and flower pedicels on April 12, 11 days earlier than recorded in previous years, at Mountville, Lancaster County. On April 13 scab was found in the additional counties of York, Chester, Delaware, and Washington.

Frogeye (Physalospora obtusa) started to show up on leaves in Lancaster County on April 12, and on April 13 it was found in Chester and Delaware Counties.

Both of these diseases appeared earlier this year than has been recorded in any previous year.--R. S. Kirby, Pennsylvania State College

APPLE SCAB DEVELOPMENT IN MARYLAND: Spores of the apple scab fungus in overwintered leaves on the ground in commercial orchards have matured 2 to 3 weeks earlier this year on the Eastern Shore and in Southern Maryland. On March 22 to 23 perithecia from these leaves showed spores developing and shooting in the Berlin, Snow Hill, Salisbury, and Cambridge areas. In the Cordova area asci were in the "banana" stage. About 30% of the spores will have discharged by March 30 under favorable wet conditions.

Perithecia in Central Maryland are enlarging rapidly, but the spores are slower in maturing. The very recent dry period has reduced the chance for scab development even though 1 to 5% of the spores had already discharged by March 30. Observations on spore development at College Park on March 24 showed about 2% ready to be discharged, on April 3 10%, and on April 12 46% had already discharged or were mature and ready to shoot, with the balance of the perithecia in the "banana" stage. This indicates that the major spore discharge would take place during the petal-fall and first cover spray periods. Examination of leaves from orchards near Rockville, Colesville, and Sandy Springs on March 31 showed conditions similar to those at College Park, with some slight delay in spore maturity at Rockville. Leaves collected at Rockville April 5 showed about 5% perithecia with spores mature, and 47% ready to shoot by April 15 if the weather conditions were favorable.

Apple orchards in the Baltimore area and extending north to Sykesville showed 5 to 10% of the perithecia with spores ready to discharge on March 27 to 28, with 50% to be discharged by April 10. At Mt. Airy 1% were mature and 30% in the "banana" stage on March 28. Spore development was considerably delayed in the Belair section on March 28 and April 5.

Examination of perithecia April 16 to 17 showed a large number of half-grown perithecia producing dwarfed asci that were discharging colorless spores about 1/3 normal size. The walls of the asci were very thin and many appeared to be disintegrating. The recent cold wave may have contributed to this odd abortive development of the fungus.

Primary scab infection was found to a very slight amount on expanding leaves in one neglected orchard near Smithsburg on April 16, and on the 17th a neglected orchard near Clear Springs showed heavy initial infection on green leaves on the lower branches.

Heavy rains during April 16 to 17 in Western Maryland has resulted in the first major spore discharge, and with the leaves being wet for 12 to 16 hours at a temperature of about 54° F there is considerable danger of a light to moderate infection in many orchards that were not covered with a fungicide just prior to the rain.--E. A. Walker, University of Maryland.

FROST DAMAGE TO FRUIT CROPS IN OHIO: Dr. C. C. Allison, Extension Pathologist, contributed the following information based on reports from Fruit Spray Service cooperators. Most of the sweet cherry crop in Southern and Eastern Ohio is a complete loss from the freezing temperatures of April 6 and 7. Sour cherries and plums were only slightly affected in the area where most of the commercial crop is grown. In general, damage to the

peach crop is not sufficient to lower crop estimates. In Southeastern Ohio most apple varieties were in bloom. In this area orchards in favored locations are expected to have a good crop, whereas the crop in orchards less favorably situated may be reduced by 50%. Late blooming varieties, such as Rome Beauty (the main variety in Southern Ohio), were least affected by the freeze. Present reports indicate a possible 20% reduction in yield in Southwestern Ohio. Elsewhere in the State apples were not appreciably affected.--Alvin J. Braun

DISEASES OF PEACH AND APPLE IN MISSOURI: A number of home peach plantings observed along the route from Central to Southeastern Missouri (April 1 to 14) were noted with moderately heavy leaf curl (Taphrina deformans) infection of the foliage. Also, along the entire route, cedar-apple rust (Gymnosporangium juniperi-virginianae) galls were conspicuous, because of their protruding telial horns, on the Juniperus spp.--T. W. Bretz

STRAWBERRY DISEASES IN LOUISIANA: Thus far (to the middle of April), production of berries in the Hammond area has been exceptionally good. The picking season started 3 to 4 weeks earlier this year, and there have been no severe losses from berry rots as yet. Klonmore and Klondyke are the principal varieties grown in this area. Although Klonmore is resistant to the main leaf-spotting fungi (Mycosphaerella spp., Diplocarpon earliana, and others), these diseases were seen in small amounts in some fields. A spray program for control of these diseases on Klondyke is followed by most growers; where it is not, leaf diseases are very evident.

Crown rot (Sclerotinia sclerotiorum) was found to be considerably more prevalent and destructive this year than last, particularly in fields with the heavier soils and poorer drainage. In a few fields, up to 15% of the plants had been killed, and from 10 to 15% more were so badly diseased as to be considered a complete loss. Another crown rot disease (in which Rhizoctonia sp. is involved) also was responsible for some damage.

In fields around Pontchatoula where grass was allowed to grow high in the middles of the rows, berry rots (mostly Botrytis sp.) were causing a loss.--Douglas C. Bain

BRIEF NOTES ON PLANT DISEASES

A NEW DISEASE OF SUGAR BEETS IN ARIZONA: Sugar beets are grown for seed in the Salt River Valley, Maricopa County, and in the Gila Valley, Graham County. Extensive plantings occur in the former location. Since the inception of the Emergency Plant Disease Prevention Project, very little disease has occurred on this crop. Cercospora beticola, leaf spot, and curly top (virus) have been observed but of minor importance. Just recently (March 1945) a few plants were observed in a planting in the Salt River Valley in which the leaves had symptoms similar to those described for ringspot (virus) on certain plants. Specimens were submitted to the Beltsville, Maryland, office of the Emergency Plant Disease Prevention Project. According to Dr. Lindsay S. Olive, the nature of the disease is not known with certainty, although it is likely to be caused by a virus. He further states that Dr. George H. Coons of the Division of Sugar Plant Investigations observed the same diseases in April of 1938 at Davis, California, and a few years later in Oregon. This is the first record of its occurrence in

Arizona.--Wm. G. Hoyman, Emergency Plant Disease Prevention Project

DOWNY MILDEW ON SNAPDRAGON IN PENNSYLVANIA: Downy mildew of snapdragon, caused by Peronospora antirrhini, was found on April 9 to be severe on plants coming into bloom in one greenhouse at Chester Springs, Chester County. The disease does not appear to have been reported previously from the Eastern United States.--R. S. Kirby, Pennsylvania State College.

CEDAR BLIGHT AND PINE DIEBACK IN NEBRASKA: Cedar blight (Phomopsis juniperovora) was seen causing considerable foliage dieback on 7-year-old eastern redcedar trees planted in strips for windbreak purposes on the farm land of the State Hospital 3 miles west of Hastings. These young trees were doubtless diseased when they were set out, as there are few redcedars in the vicinity that could serve as carriers.

Diplodia dieback (D. pinea) was seen on Austrian (Pinus nigra) and Scotch (Pinus sylvestris) pines in many localities in Eastern and Southeastern Nebraska. Its attack is most objectionable where pines of these species are used for ornamental or landscape gardening purposes.--C. M. Slagg, Emergency Plant Disease Prevention Project. Mar.-Apr.